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The first records of *Cyclosa bifida* (Araneae: Araneidae) from Thailand and Laos with redescription of the male and female

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Abstract — *Cyclosa bifida* (Doleschall 1859) is recorded from Thailand and Laos for the first time with a redescription of its male and female.

Key words — Spiders, Taxonomy, Systematics, Indochina, Indo-Burmese hotspot

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Introduction

Several studies of spiders from Thailand and Laos have been recently reported (e.g. Deeleman-Reinhold 2001, Jäger 2007, Dankittipakul & Singtripop 2008, Dankittipakul & Wang 2008, Dankittipakul & Zhang 2008, Jäger & Praxaysombath 2009, Tanikawa et al. 2010, Jäger & Dankittipakul 2010, Jäger & Praxaysombath 2011, Jäger 2012, Jäger et al. 2012, Lin et al. 2013), among which new species and new records were reported. Such findings suggest many more species in this area waiting to be revealed (Norma-Rashid & Li 2009). *Cyclosa bifida* (Doleschall 1859) is widely distributed from India to Philippines and New Guinea (Platnick 2013), but has not been recorded from Thailand and Laos so far. Although the female of this species has been redescribed several times using specimens from various areas (Tikader 1966, 1982; Chrysanthus 1971; Barrion & Litsinger 1995), the only description of the male was made by Workman (1896) with a short description and minimal detail of palpal organs. In this paper we report the first record of *Cyclosa bifida* from Thailand and Laos and redescribe the female and male with a detailed description.

Materials and methods

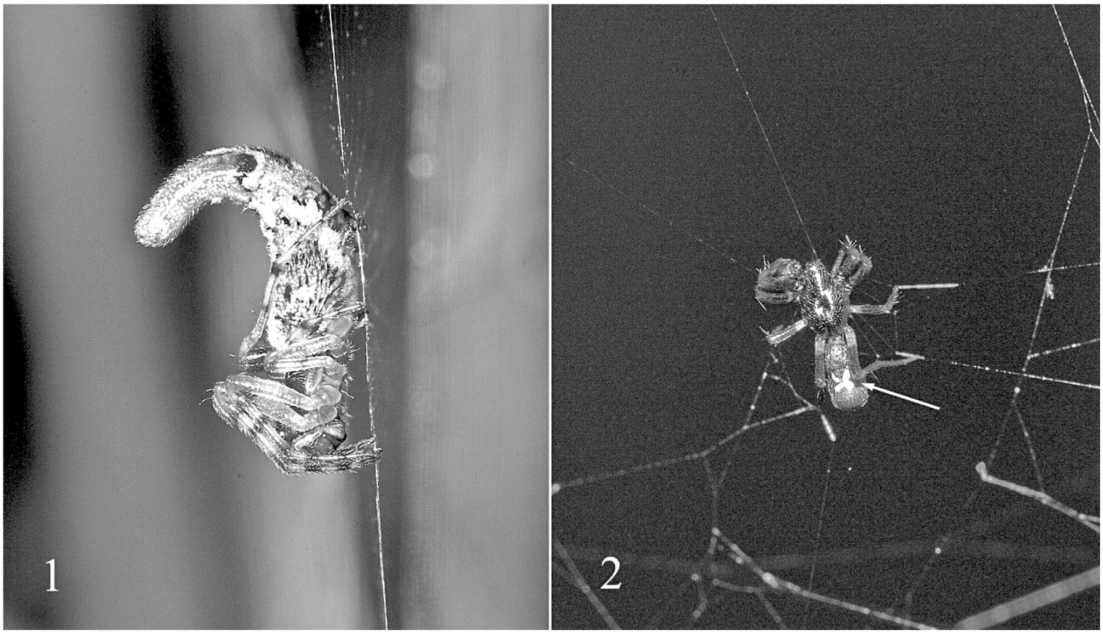
Spider photos were taken by Canon EOS 400D with EF 100 mm f/2.8 Macro USM Lens. Spiders were collected from field and preserved in 75% after transferring to laboratory. The male palps were dissected before illustrating. All examinations, measurements, and illustrations were conducted using Olympus SZH stereomicroscope. The specimen from Laos is deposited in the collection of the Faculty of Environmental Sciences, National University of Laos (FES, NUL). The specimens from Thailand are deposited in the collection of the Princess Maha Chakri Sirindhorn Natural History Museum, Prince of Songkla University, Thailand (PSUZC, PSU). The terminology follows Tanikawa (1992).

Taxonomy

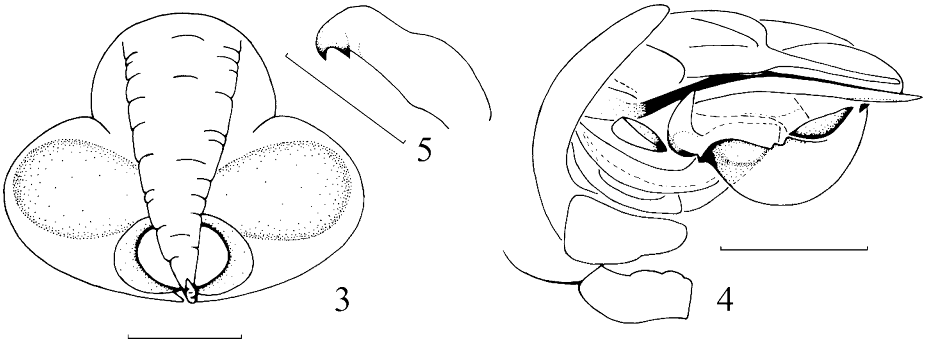
Cyclosa bifida (Doleschall 1859)
[Thai name: Mangmoum-Torng-Yaao-Cyclosa]
(Figs. 1–5)

Epeira bifida Doleschall 1859, p. 38, pl. 2, fig. 8; Workman 1896, p. 33, pl. 33.
Epeira macrura Thorell 1877, p. 402.
Cyclosa bifida: Simon 1895, p. 779, fig. 852; Tikader 1966, p. 14, figs. 31–34; Chrysanthus 1971, p. 21, figs. 34–36; Tikader 1982, p. 185, figs. 351–355; Barrion & Litsinger 1995, p. 608, figs. 381 a–g.
Cyclosa macrura: Strand 1911, p. 149.

Specimens examined. LAOS: 1♂, 17°59′36″N, 104°49′23″E, 184 m altitude, mixed deciduous forest; on the top of a limestone outcrop, upper Nam Hinboun, about 3–4 km north of Tha Khan Keo Village, Khammouan Limestone NBCA, Nakhai District, Khammouan Province, 31-V-2012, B. Douangboubpha leg. [FES.AR.12.001]. THAILAND: 1 ♀, Rubber Plantation, 16-V-2012 [PSUZC_AR 001 690], 1 ♀, Rubber-agroforest, 17-V-2012 [PSUZC_AR 001 691], 6°



Figs. 1–2. *Cyclosa bifida* on a web from a rubber plantation near Khuan Khao Wang Forest Park, Tambon Chalung, Hat Yai District, Songkhla Province, Thailand. 1, female [PSUZC_AR 001 87]; 2, male [PSUZC_AR 001 88].



Figs. 3–5. *Cyclosa bifida*, female from a rubber plantation, Tambon Nawa, Chana District, Songkhla Provine, Thailand [PSUZC_AR 001 690] and male from Chulabhornpattana 10th Village, Betong District, Yala Province, Thailand [PSUZC_AR 001 689]. 3, epigyne, ventral view; 4, male left palp, lateral view; 5, median apophysis of male palp (distal part). Scales = 0.25 mm.

54′00″N, 100°39′00″E, 70 m altitude, Tambon Nawa, Chana District, Songkhla Provine, V. Saksongmuang leg.; 1 juv., 7°04′12″N, 100°31′29″E, 28 m altitude, Rubber-agroforest, Tambon Nam Noi, Hat Yai District, Songkhla Province, 24-IV-2012, V. Saksongmuang leg. [PSUZC_AR 001 692]; 1♂, 7-XII-2008 [PSUZC_AR 001 88], 1♀, 10-IIX-2008 [PSUZC_AR 001 87], from 6°59′43″N, 100°19′50″E to 7° 1′37″N, 100°18′20″E, ca 200 m altitude, Rubber Plantation near secondary forest (Khuan Khao Wang Forest Park), Tambon Chalung, Hat Yai District, Songkhla Province, B. Petcharad leg.; 1♂, 1♀, 7°92′N, 99°25′E, ca 50 m altitude, Khao Pra-Bang Kram Wildlife Sanctuary, Khlong Thom District, Krabi Province, 25-I-2010, B. Petcharad leg. [PSUZC_AR 001 694]; 1♂, 3♀, 1subadult♂, 5°51′N, 101° 14′E, 550–600 m altitude Chulabhornpattana 10th Village, Betong District, Yala Province, 12-IV-2010, B. Petcharad leg. [PSUZC_AR 001 689].

Diagnosis. Female of this species can be easily recognized in the field by its slender elongate abdomen (Fig. 1) and the male can be easily recognized in the field by a shiny silver x-shaped marking on dorsum (Fig. 2, arrow).

Description. Based on 1♀ [PSUZC_AR 001 690] from Rubber Plantation, Tambon Nawa, Chana District, Songkhla Province and 1♂ [PSUZC_AR 001 689] from Chulabhornpattana 10th Village, Betong District, Yala Province. Measurements in parentheses indicate the range among specimens examined (4♂, 7♀). Measurements (in mm). Body ♀ 8.47 (4.00–8.50), ♂ 3.00 (3.00–3.52) long; carapace ♀ 2.07 (1.60–2.10), ♂ 1.54 (1.54–1.76) long, ♀ 1.27 (1.00–1.27), ♂ 1.00 (1.00–1.16) wide; abdomen ♀ 6.07 (2.20–6.60), ♂ 1.48 (1.48–1.76) long, ♀ 2.00 (1.04–2.00), ♂ 0.92 (0.92–1.24) wide. Length of legs as shown in Table 1.

Female. Carapace longer than wide [length/width 1.63

Table 1. Length of the leg segments of *Cyclosa bifida* (Doleschall 1859) (in mm; ♀/♂).

Leg	Tarsus	Metatarsus	Tibia	Patella	Femur	Total
I	0.60/0.48	0.80/0.80	1.33/0.96	0.80/0.48	1.73/1.20	5.27/3.92
II	0.53/0.44	0.67/0.72	1.20/0.80	0.67/0.40	1.53/1.12	4.60/3.48
III	0.47/0.24	0.67/0.44	0.77/0.56	0.47/0.28	1.13/0.80	3.50/2.32
IV	0.47/0.44	1.13/0.84	1.50/0.96	0.60/0.36	1.73/1.20	5.43/3.80

(1.57–1.73)]; median ocular area wider than long [length/width 0.80 (0.63–0.94)], wider in front than behind [anterior width/ posterior width 1.25 (1.25–1.60)]. Cervical groove conspicuous. Chelicerae with 4 promarginal and 3 retromarginal teeth. Labium wider than long [length/width 0.72 (0.50–0.81)]; sternum longer than wide [length/width 1.30 (1.25–1.43)]. Length of leg 1/carapace 2.55 (2.44–2.80). Abdomen longer than wide [length/width 3.03 (1.74–3.47)]; slender and elongate (Fig. 1). Female genitalia (Fig. 3); scape of epigyne triangular, slender, slightly wrinkled.

Male. Carapace longer than wide [length/width 1.54 (1.41–1.54)]; median ocular area wider than long [length/-width 0.75 (0.61–0.81)], wider in front than behind [anterior width/ posterior width 1.60 (1.60–2.00)]. Clearly pitted at fovea. Depressed over carapace surface. Chelicerae with 4 promarginal and 3 retromarginal teeth. Labium wider than long [length/width 0.75 (0.67–0.80)]; sternum longer than wide [length/width 1.23 (1.23–1.55)]. Length of leg 1/ carapace 2.55 (2.55–2.87). Noticeable knotting on the femurs. Abdomen longer than wide [length/width 1.61 (1.42–1.72)]. Male palp (Figs. 4–5): basal lamella of median apophysis projecting, paramedian apophysis visible in prolateral view and its shape as shown in Fig. 4, embolus filiform, median apophysis distally bifurcated (Fig. 5).

Coloration and marking. Female. Carapace dark brown. Abdomen pale brown; mottled with dark brown, especially at the tip of abdomen; scattered with silver marking, the marking on central dorsum formed like longitudinal silver band. Legs brown with dark brown bands, especially the conspicuous bands at the tip of femurs.

Male. Carapace dark brown. Abdomen blackish brown, with black spot covering the tip of abdomen, mottled with extremely pale brown, with two silver spots on dorsum.

Variation. Female. Abdomen elongated but occasionally not slender; compressible at two-third of abdomen or between spinnerets and the tip of abdomen. Carapace dark or pale brown. Abdomen dark or pale brown, mottled with black, blackish or dark brown; occasionally silver markings on dorsum form two pairs of silver spots. Legs, on occasion pale brown with dark brown bands.

Male. Sometimes, with four silver spots forming a pattern roughly x-shaped on the dorsum of the abdomen (Fig. 2, arrow).

Distribution. Thailand and Laos (this paper), India (Tikader 1966, 1982), Singapore (Koh 2000), Malaysia (Thorell 1877, Workman 1896, Song et al. 2002, Norma-Rashid & Li 2009), Philippines (Barrion & Litsinger 1995), Indonesia (Doleschall 1859, Strand 1911), New Guinea (Thorell 1877, Chrysanthus 1971).

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